#90 9/1 AF 2634 Brief on Appeal

Patent

Attorney's Docket No. 040070-238 1.29.04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	
	)	
Rozbeh ATARIUS et al.	)	Group Art Unit: 2634
	)	
Application No.: 09/204,370	)	Examiner: D. LUGO
	)	
Filed: December 4, 1998	)	Appeal No.
	)	
For: METHOD AND APPARATUS FOR CONFIGURING A RAKE RECEIVER	)	

BRIEF FOR APPELLANT

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated August 26, 2003 (Paper No. 12), finally rejecting claims 1-16, 18, 19, 21, 22, 24, 26, 27, 29 and 31, which are reproduced as an Appendix to this brief.

A check covering the [ ] $165.00 (2402) [X] $330.00 (1402) Government fee and two extra copies of this brief are being filed herewith.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. A copy of this page and the signature page are submitted in duplicate.

I. Real Party in Interest

The present application is assigned to Telefonaktiebolaget LM Ericsson, a corporation duly organized under and pursuant to the laws of Sweden and having its principal place of business at S-126 25 Stockholm, Sweden.

II. Related Appeals and Interferences

The Appellants' legal representative, or assignee does not know of any other appeal or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-16, 18, 19, 21, 22, 24, 26, 27, 29 and 31 are pending, wherein all of these claims have been rejected

IV. Status of Amendments

There have been no amendments filed after the rejection dated August 26, 2003

V. Summary of the Invention

The present invention generally relates to the radio communications systems, and more particularly the configuration of RAKE receivers. In mobile communication systems, signals transmitted between base and mobile stations typically suffer from echo distortion or time dispersion, which are referred to in the art as multipath delay. Accordingly, a receiver will receive a composite signal of multiple versions of the transmitted signal that have propagated along different paths. To reconstruct the received signal, a receiver typically includes RAKE fingers, each of which are assigned to one of the different paths. The RAKE receiver uses a form of diversity combining to collect the signal energy from the various received signal paths.

Typically, as a mobile station moves through its environment, new paths are found and other paths disappear. In order to provide different paths to the RAKE fingers a path searcher is employed. A path searcher is typically implemented using matched filters, which are costly, computationally complex and decrease battery life in hand-held units. Accordingly, it would be desirable to provide a diversity scheme which reduces the computational complexity of the RAKE receiver.

The present invention overcomes the above-identified and other deficiencies of conventional RAKE receivers by providing a multi-stage apparatus for configuring a RAKE receiver. Referring now to figure 4 of the present application, a first stage 100 receives an input signal 112, the input signal including a plurality of delay paths. The first stage 100 uses the received signal to find a set of more than N paths, where N represents the number of fingers in the RAKE receiver. A second stage 200 receives the first set of more than N paths, the input signal and a quality signal from the RAKE receiver and generates a set of N paths. A third stage 300 uses the set of N paths to configure the N fingers of the RAKE receiver. In accordance with exemplary embodiments, the second stage generates the set of N paths more frequently than the first stage generates the set of N paths. Accordingly, as some paths fade and other paths grow stronger, the second stage 200 can provide a new set of paths for the RAKE fingers, without requiring the first stage to perform the computationally intensive task of identifying new paths.

Referring now to figure 5, in accordance with another aspect of the present invention, a RAKE receiver comprises a number of RAKE fingers 230-332, a searcher 101, and a selector 201. The searcher 101 is configured to use an input signal to find a set of candidate paths, wherein the set of candidate paths includes M paths. The selector 201 is configured to use the input signal, the set of candidate paths from the searcher, and a quality signal from the RAKE receiver to select a smaller set of candidate paths. The selector 201 comprises k*M correlators, wherein K correlators are assigned to each of the selected paths, and the selector 201 is configured to use the k*M correlators to generate M estimates.

VI. The Issues

There are three issues for this appeal:

1) Whether the rejection of claims 19 and 21 under 35 U.S.C. §103(a) as being obvious in view of the combination of English translation of Japanese Patent No. 10-164011 ("Kitade") and U.S. Patent No. 6,072,807 to Daudelin ("Daudelin") is proper;

2) Whether the rejection of claims 1-10, 13-16, 18, 22, 24, 26, 27, 29 and 31 under 35 U.S.C. § 103(a) as being obvious in view of the combination of Kitade, Daudelin and U.S. Patent No. 6,456,827 to Kubo et al. ("Kubo") is proper; and

3) Whether the rejection of claims 11 and 12 are rejected under 35 U.S.C. § 103(a) as being obvious in view of the combination of Kitade, Daudelin, Kubo and U.S. Patent No. 5,987,012 to Bruckert et al. ("Bruckert") is proper.

VII. Grouping of Claims

For the purposes of this appeal, the claims are grouped as follows:

-claims 1-7 and 13 stand or fall together;

-claims 8 and 10 stand or fall together;

-claim 9 stands or falls alone;

-claims 14, 15 and 18 stand or fall together;

-claim 16 stands or falls alone;

-claims 19 and 21 stand or fall together;

-claims 22, 24 and 26 stand or fall together; and

-claims 27, 29 and 31 stand or fall together.

VIII. Argument

A. The Combination of Kitade and Daudelin Does Not Render Claims 19 and 21 Obvious

The combination of Kitade and Daudelin does not render claims 19 and 21 obvious because the combination does not disclose or suggest all of the elements of claims 19 and 21. For example, the combination of Kitade and Daudelin does not disclose or suggest "a selector, the selector configured to use the input signal, the set of candidate paths and a quality signal from the RAKE receiver to select a smaller set of candidate paths" as recited in claim 19. Additionally, one of ordinary skill in the art would not have been motivated to combine Kitade and Daudelin in the manner described by the Examiner. Claim 21 depends from claim 19, and hence, is patentably distinguishable over the combination of Kitade and Daudelin for the same reasons as claim 19.

1. The Disclosure of Kitade

Kitade discloses equipment for spread-spectrum communication. Specifically, Kitade is directed to RAKE receivers for use in spread-spectrum communication system. Kitade discloses that conventional RAKE receivers employ a correlator for search 300, a correlator for trackings 302 and a correlator for modulation 304. (Figure 3 of Kitade). The correlator for search 300 is used for establishing synchronization to the input-signal data by performing a sliding correlation. (Paragraph 0004). The correlator for trackings 302 performs synchronous tracking of signals for use by the correlator for modulation 304. Kitade discloses that the correlator for search of conventional RAKE receivers requires several correlator-for-modulation minutes to choose a phase, and that when an input signal level is small it is necessary to equalize a correlation value with a comparatively long time constant. (Paragraph 0005). Additionally, Kitade discloses that in multipath environments the phase provided by the correlator for search may not track instant fluctuation of the paths, and hence, it may not be possible to perform demodulation without increasing the number of RAKE fingers.

To overcome the deficiencies of conventional RAKE receivers, Kitade discloses the addition of path selection equipment 209 to the conventional RAKE receiver. (Figure 2 of Kitade). Specifically, the path selection equipment 209 allows the correlator for trackings 202 to track more paths then the number of correlators for modulation 204. Accordingly, the path selection equipment 209 selects a number of paths equal to the number of correlators for modulation 204, the number of selected paths being those paths which have the highest correlation value peak output. However, Kitade does not disclose or suggest "a selector, the selector configured to use the input signal, the set of candidate paths and a quality signal from the RAKE receiver to select a smaller set of candidate paths" as recited in claim 19.

2. The Disclosure of Daudelin

Daudelin discloses a system for searching for signals to assign to the fingers of a RAKE receiver. Specifically, Daudelin discloses a finger assignor 404 which searches for paths using searcher 411. Based upon the paths searched for by searcher 411 and, among other things, a signal quality provided by the RAKE receiver, the finger assignor 404 assigns the fingers of the RAKE receiver for tracking particular paths. The RAKE receiver 407 includes fingers and fingertips. Daudelin discloses that the fingers have one of three states: inactive, assigned or reserved. When a finger is in the assigned state, the finger demodulates a signal and provides it to a combine 412. When a finger is in the reserved state it can be demodulated by the finger, but it is not provided to the combiner 412. (Col. 5, lines 36-39). When there are no fingers in the inactive state to which a signal is to be assigned by the finger assignor 404, the new signal is assigned to a finger in the reserved state, and a fingertip is assigned to continue to search for the signal for the duration of the reserved period. Accordingly, it appears that Daudelin discloses that the RAKE fingers and fingertips perform some type of tracking function.

3. The Combination of Kitade and Daudelin Does Not Disclose or Suggest All of the Elements of Claim 19

As discussed above, Kitade discloses a system which employs a correlator for search, a correlator for trackings and a selector which selects paths from the correlator for trackings for demodulation by the correlator for modulation. Moreover, Daudelin discloses a system which includes a RAKE receiver which provides a quality signal to a searcher (finger assignor 404), and uses RAKE fingers and fingertips to perform a tracking function. Accordingly, assuming that one of ordinary skill in the art would have been motivated to modify Kitade to include the quality signal provided by the RAKE receiver disclosed by Daudelin, the modified disclosure of Kitade would be one in which a quality signal is provided to the correlator for search of Kitade, as is consistent with Daudelin's disclosure of providing a quality signal to a searcher. Because Daudelin discloses RAKE fingers and fingertips which perform a tracking function, and Daudelin does not disclose or suggest that the tracking function uses quality signals from a RAKE receiver, it is respectfully submitted that there is nothing in Daudelin which discloses or suggests that the finger assignor of Daudelin which performs a searching function could be modified from being an integral part of the searching function to be a part of the tracking function. Therefore, even if Kitade and Daudelin could be combined, the combination does not disclose or suggest "a selector, the selector configured to use the input signal, the set of candidate paths and a quality signal from the RAKE receiver to select a smaller set of candidate paths" as recited in claim 19.

4. The Examiner's Proposed Combination of Kitade and Daudelin

To reject claim 19, the Examiner asserts that the correlator for search along with other elements of Kitade correspond to the searcher of claim 19, and that the correlator for trackings, the path selection equipment 209 and other elements of Kitade correspond to the selector recited in claim 19. The Examiner acknowledges that Kitade does not disclose or suggest a selector which uses a quality signal from the RAKE receiver as recited in claim

19. To remedy this deficiency of Kitade, the Examiner relies upon the use of signal quality of signals from the RAKE receiver by the finger assignor 404 of Daudelin. However, the finger assignor 404 of Daudelin is disclosed as performing the function of a searcher and Daudelin provides a separate tracking function. Accordingly, even if one of ordinary skill in the art would have been motivated to combine the elements of Kitade and Daudelin relied upon by the Examiner to reject claim 19, the combination would at most disclose or suggest the use of the quality of signals from the RAKE receiver by the correlator for search, and not the use of such signals by the correlator for trackings as asserted by the Examiner.

In response to a similar argument to that above, the Examiner asserts that "in addition to providing the functions of a searcher, the finger assignor of Daudelin provides the function of selecting or assigning paths to be demodulated in the RAKE receiver." (Advisory Action dated November 5, 2003). However, to reject claim 19 the Examiner asserts that the correlator for trackings and the path selection equipment 209 of Kitade corresponds to the selector of claim 19. The Examiner has not explained why one of ordinary skill in the art would have been motivated to move the path selection function of Daudelin, which is disclosed by Daudelin as an integral part of the path searching function, to the tracking function of Kitade. Daudelin discloses both a searcher function, included along with the finger assignor function, and some type of tracking function, performed by the fingers and fingertips of the RAKE receiver. Accordingly, assuming there is some type of motivation, it appears that one of ordinary skill in the art would provide quality signals from the RAKE receiver to a searching function, and not to a tracking function as asserted by the Examiner.

Because the combination of Kitade and Daudelin does not disclose or suggest all of the elements of claim 19, and because one of ordinary skill in the art would not have been motivated to combine the disclosures of Kitade and Daudelin in the manner described by the Examiner, it is respectfully submitted that claim 19 is patentably distinguishable over the combination of Kitade and Daudelin. Claim 21 depends from claim 19, and hence, is

patentably distinguishable over the combination of Kitade and Daudelin for at least those reasons stated above with regard to claim 19.

B. The Combination of Kitade, Daudelin and Kubo Does Not Render Claims 1-10, 13-16, 18, 22, 24, 26, 27, 29 and 31 Obvious

1. The Disclosure of Kubo

Kubo discloses an apparatus and method for controlling communications based on moving speed. Kubo discloses that there are optimal values for parameters in the receiver, and that these optimal values can fluctuate based on the moving speed of the receiver. (Col. 1, lines 62-67). To overcome this problem, Kubo discloses using a speed estimation unit and a modification unit to control the optimal values based on the moving speed of the receiver. Specifically, referring now to the first and second receiver embodiments illustrated in figures 3 and 11 of Kubo, the receiver comprises a demodulator unit and a searcher. Kubo discloses adjusting the search frequency of the searcher based on the moving speed of the receiver. (Col. 6, lines 16-32). However, Kubo does not disclose a tracking function.

2. The Combination of Kitade, Daudelin and Kubo Does Not Disclose Or Suggest All of The Elements of Claims 1-7 and 13

The combination of Kitade, Daudelin and Kubo does not render claim 1 unpatentable because the combination does not disclose or suggest all of the elements of claim 1. For example, the combination does not disclose or suggest "a second stage, the second stage configured to use the first set of more than N paths, the input signal and a quality signal from the RAKE receiver to generate a set of N paths, the second stage generates the set of N paths more frequently than the first stage generates the set of more than N paths."

a. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest a Second Stage Using a Quality Signal From a RAKE Receiver

To reject claim 1, the Examiner asserts that the correlator for search along with other elements of Kitade correspond to the first stage of claim 1, while the correlator for trackings along with other elements of Kitade correspond to the second stage recited in claim 1. However, the Examiner recognizes that Kitade does not disclose or suggest that the correlator for trackings uses a quality signal from the RAKE receiver. To remedy this deficiency, the Examiner relies upon Daudelin. As discussed above with regard to claim 19, the quality signal disclosed in Daudelin is provided from the RAKE receiver to the searcher, and not a correlator for trackings as asserted by the Examiner. Accordingly, for similar reasons to that discussed above with regard to claim 19, the combination of Kitade and Daudelin does not disclose or suggest a second stage which is configured to use a quality signal from the RAKE receiver as recited in claim 1. Moreover, for similar reasons to those discussed above with regard to claim 19, one of ordinary skill in the art would not have been motivated to combine Kitade and Daudelin in the manner described in the Office Action. Additionally, it is respectfully submitted that Kubo does not remedy either of the above-identified deficiencies of the combination of Kitade and Daudelin.

b. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest a Second Stage Generating Paths More Frequently Than a First Stage

The Examiner asserts that Kitade and Daudelin does not disclose or suggest that "the second stage generates the set of N paths more frequently than the first stage generates the set of more than N paths," and relies upon Kubo as remedying this alleged deficiency of the combination of Kitade and Daudelin. Based upon this assertion by the Examiner, the Appellants previously argued that the combination of Kitade, Daudelin and Kubo does not disclose or suggest that "the second stage generates the set of N paths more frequently than the first stage generates the set of more than N paths." However, upon a further review of the cited documents, it appears that Kitade discloses such. Specifically, Kitade

discloses that if there were an equal number of paths tracked as the number of correlators for the demodulator and the paths fall below a threshold value, the signal cannot be demodulated until a searching is finished. (Paragraph 0017 of Kitade). Kitade discloses that if more paths than correlators in the demodulator are tracked, one of the additional paths may be above a threshold value, and hence, it is not necessary to wait for the end of the searching to provide a path to the correlators in the demodulator. Accordingly, it appears that Kitade does disclose that the tracker generates paths for the correlators in the demodulator more frequently than the searcher generates its set of paths. Because Kitade discloses such, it is unclear why one of ordinary skill in the art would have been motivated to even look to the disclosure of Kubo, as did the Examiner, and hence, any motivation provided by the Examiner to combine Kubo with Kitade and Daudelin would not in fact have motivated one of ordinary skill in the art because such a functionality is already provided by Kitade.

Assuming that the Appellants' interpretation of Kitade described above is incorrect, and the Examiner's interpretation of Kitade as not disclosing or suggesting that "the second stage generates the set of N paths more frequently than the first stage generates the set of more than N paths," it is respectfully submitted that such a combination does not disclose or suggest such. To remedy the deficiency of the combination of Kitade and Daudelin identified by the Examiner, the Examiner relies upon Kubo. Specifically, the Examiner relies upon Kubo's disclosure of optimizing the frequency of the search operations based on the moving speed of the mobile station. However, Kubo does not disclose a tracker and hence, Kubo cannot disclose or suggest that a correlator for trackings, such as that disclosed by Kitade, generates the set of N paths more frequently than the correlator for search generates the set of more than N paths. In other words, Kubo does not disclose or suggest a relationship between the generation of paths in a correlator for tracking and a correlator for search, and hence, the changing of the frequency of the searcher disclosed by Kubo is not sufficient to reject claim 1 which recites a relationship between the generation of paths in the first and second stages.

Because the combination of Kitade, Daudelin and Kubo does not disclose or suggest all of the elements of claim 1, and because there is no motivation to combine Kitade, Daudelin and Kubo in the manner described in the Office Action, it is respectfully submitted that the rejection of claim 1 as allegedly being obvious in view of the combination of Kitade, Daudelin and Kubo is improper.

c. The Combination of Kitade, Daudelin and Kubo Does Not Render Claims 2-7 and 13 Unpatentable

Claims 2-7 and 13 variously depend from claim 1, and hence, are patentably distinguishable over the combination of Kitade, Daudelin and Kubo for at least those reasons stated above with regard to claim 1.

3. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest All of The Elements of Claims 8-10

a. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest All of the Elements of Claim 8

The combination of Kitade, Daudelin and Kubo does not disclose or suggest "the first stage configured to use an output of a matched filter to generate the first set of more than N paths" as recited in claim 8. The Examiner recognizes that Kitade and Daudelin do not disclose or suggest the use of a matched filter, and instead relies upon Kubo. Specifically, the Examiner asserts that searchers using matched filters as disclosed by Kubo are well known in the art, and hence "[i]t would have been obvious to one of ordinary skill in the art to use a searcher using a matched filter in the RAKE receiver of Kitade as searchers using matched filters and those using correlators are well-recognized art equivalents." However, merely because matched filters and correlators are allegedly well recognized art equivalents does not explain why one of ordinary skill in the art would have been motivated to modify Kitade to use matched filters. For example, the present application at page 1, lines 15-17, describes that "[u]sing a matched filter is costly and

computationally complex. It is not only time-consuming; it also decreases the battery life of hand-held units." Accordingly, it is respectfully submitted that in the absence of some explanation as to why one of ordinary skill in the art would have ignored the cost and computational complexity of matched filters, merely because correlators and matched-filters are allegedly art recognized equivalents does not satisfy the motivation requirement of an obviousness rejection under 35 U.S.C. § 103(a). Accordingly the rejection of claim 8 is improper.

b. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest All of the Elements of Claim 9

The combination of Kitade, Daudelin and Kubo do not render claim 9 unpatentable because the combination does not disclose or suggest "the second stage configured to generate a new set of N paths while the first stage is inactive."

The Examiner relies upon Kubo's disclosure of the changing of the frequency of the searcher based upon the mobile station moving speed disclosed by Kubo, and more specifically, the disclosure that the search operation is not performed until a time period elapses as allegedly disclosing or suggesting that the selector is "configured to generate a new subset of paths while the searcher is inactive." However, as discussed above, Kubo does not disclose or suggest both a searcher and a selector, but instead only discloses a searcher. Accordingly, Kubo could not possibly disclose a relationship between the selector and the searcher, much less that the selector is configured to generate a new subset of paths while the searcher is inactive. It is respectfully submitted that Kitade and Daudelin each fail to disclose a relationship between the selector and the searcher recited in claim 9, and hence, the rejection of claim 9 is improper.

c. The Combination of Kitade, Daudelin and Kubo Does Not Render Claim 10 Unpatentable

Claim 10 depends from claim 8, and is, therefore, patentably distinguishable over the combination of Kitade, Daudelin and Kubo for at least those reasons stated above with regard to claim 8.

4. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest All of The Elements of Claims 14, 15 and 18

Claim 14 is not rendered obvious by the combination of Kitade, Daudelin and Kubo because the combination does not disclose or suggest all of the elements of claim 14. For example, the combination does not disclose or suggest "a selector, the selector configured to use the input signal, the set of candidate paths and a quality signal from the RAKE receiver to select a subset of candidate paths that are used to configure the RAKE receiver, the selector configured to generate a new subset of paths while the searcher is inactive."

As discussed above with regard to claims 1 and 19, the combination of Kitade, Daudelin and Kubo does not disclose or suggest a selector which is configured to use a quality signal from the RAKE receiver to select a subset of candidate paths, and that one of ordinary skill in the art would not have been motivated to combine Kitade, Daudelin and Kubo in the manner described in the Office Action.

The Examiner relies upon Kubo's disclosure of the changing of the frequency of the searcher based upon the mobile station moving speed disclosed by Kubo, and more specifically, the disclosure that the search operation is not performed until a time period elapses as allegedly disclosing or suggesting that the selector is "configured to generate a new subset of paths while the searcher is inactive." However, as discussed above, Kubo does not disclose or suggest both a searcher and a selector, but instead only discloses a searcher. Accordingly, Kubo could not possibly disclose a relationship between the selector and the searcher, much less that the selector is configured to generate a new subset of paths while the searcher is inactive. It is respectfully submitted that Kitade and Daudelin each fail to disclose a relationship between the selector and the searcher recited in claim 14. Accordingly, it is respectfully submitted that the rejection of claim 14 as

allegedly being unpatentable over the combination of Kitade, Daudelin and Kubo is improper.

Claims 15 and 18 variously depend from claim 14, and hence, are patentably distinguishable over the combination of Kitade, Daudelin and Kubo for at least those reasons stated above with regard to claim 14.

5. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest All of The Elements of Claim 16

The combination of Kitade, Daudelin and Kubo does not disclose or suggest a "searcher configured to use an output of a matched filter to generate the set of candidate paths" as recited in claim 16. The Examiner provides the same reasoning to modify the combination of Kitade, Daudelin and Kubo to reject claim 16 as was provided to reject claim 8. Accordingly, the combination of Kitade, Kubo and Daudelin does not render claim 16 unpatentable for similar reasons to those discussed above with regard to claim 8, and hence, the rejection of claim 16 is improper. Claims 8 and 16 stand or fall separately because they depend from independent claims which have been argued separately.

6. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest All of The Elements of Claims 22, 24 and 26

The combination of Kitade, Daudelin and Kubo does not render claim 22 unpatentable because the combination does not disclose or suggest all of the elements of claim 22. For example, the combination of Kitade, Daudelin and Kubo does not disclose or suggest the step of "selecting a second set of paths from the first set of paths based on a second set of correlation values and a quality signal from the RAKE receiver." Additionally, the combination of Kitade, Daudelin and Kubo does not disclose or suggest the step of "updating the second set of paths without updating the first set of paths."

As discussed above with regard to claim 1, the combination of Kitade, Daudelin and Kubo does not disclose or suggest a "second stage configured to use the first set of more

than N paths, the input signal and a quality signal from the RAKE receiver to generate a set of N paths." For similar reasons to those discussed above with regard to claim 1, the combination of Kitade, Daudelin and Kubo does not disclose or suggest the step of "selecting a second set of paths from the first set of paths based on a second set of correlation values and a quality signal from the RAKE receiver."

To reject the step of "updating the second set of paths without updating the first set of paths" the Examiner relies upon the disclosure in column 8, lines 41-45 of Kubo that after a search operation is completed, the search operation is not performed again until the expiration of a timer. However, Kubo discloses a system which includes a searcher 25 and a demodulator unit 24. Accordingly, Kubo, at most discloses not searching for a signal while continuing to demodulate signals. There is no disclosure or suggestion in Kubo that a correlator for trackings (relied upon by the Examiner to reject the selecting step of claim 22) should update paths while a searcher (relied upon by the Examiner to reject the searching step of claim 22) does not update its set of paths. Accordingly, even if one of ordinary skill in the art would have been motivated to combine the disclosures of Kitade, Daudelin and Kubo relied upon by the Examiner, the combination would, at most, disclose a system where a correlator for search and a correlator for tracking do not update their paths until the expiration of a time period. In other words, from the disclosure of Kubo, one of ordinary skill in the art would have been motivated to only update paths from the correlator for search and the correlator for trackings based on the moving speed of the receiver, because Kubo discloses that when the receiver is moving above a certain speed that it is necessary to update the optimal values for parameters to protect against fading. Accordingly, the combination of Kitade, Daudelin and Kubo does not render claim 22 unpatentable, and hence, the rejection of this claim is improper.

Claims 24 and 26 depend from claim 22, and are, therefore, patentably distinguishable over the combination of Kitade, Daudelin and Kubo for at least those reasons stated above with regard to claim 22. Accordingly, the rejection of claims 24 and 26 is improper.

7. The Combination of Kitade, Daudelin and Kubo Does Not Disclose or Suggest All of The Elements of Claims 27, 29 and 31

The combination of Kitade, Daudelin and Kubo does not render claim 27 unpatentable because the combination does not disclose or suggest all of the elements of claim 27. For example, the combination does not disclose or suggest the step of "selecting a second set of paths from the first set of paths based on the correlation values, the input signal and a quality signal from the RAKE receiver." Additionally, the combination does not disclose or suggest the step of "updating the second set of paths without updating the first set of paths."

As discussed above with regard to claim 1, the combination of Kitade, Daudelin and Kubo does not disclose or suggest a selection based on a quality signal from a RAKE receiver. Additionally, the combination of Kitade, Daudelin and Kubo does not disclose or suggest a selection based on the correlation values generated by a searching function. Specifically, it appears that in Kitade the selection of a path by path selection unit 209 is based on the correlation values of the correlator for trackings. Additionally, it is respectfully submitted that there is nothing in the disclosures of Daudelin and Kubo which would have suggested to one of ordinary skill in the art to modify the system of Kitade such that the path selection unit 209 selects paths *based on values from the correlator for search*. It should be noted that the Examiner groups claims 22 and 27 together in a single rejection, and the Examiner has not even addressed this difference from claim 22. Hence, the combination of Kitade, Daudelin and Kubo does not disclose or suggest the step of "selecting a second set of paths from the first set of paths based on **the correlation values**, the input signal and **a quality signal from the RAKE receiver**" as recited in claim 27. (Emphasis added).

Moreover, for similar reasons to those discussed above with regard to claim 22, the combination of Kitade, Daudelin and Kubo does not disclose or suggest the step of

"updating the second set of paths without updating the first set of paths." Accordingly, the rejection of claim 27 is improper.

Claims 29 and 31 depend from claim 27, and are, therefore, patentably distinguishable over the combination of Kitade, Daudelin and Kubo for at least those reasons stated above with regard to claim 27.

C. The Combination of Kitade, Daudelin, Kubo and Bruckert Does Not Disclose Or Suggest All of The Elements of Claims 11 and 12

Claims 11 and 12 depend from claim 1. As discussed above, the combination of Kitade, Daudelin and Kubo does not render claim 1 unpatentable. It is respectfully submitted that Bruckert does not overcome the above-identified deficiencies of the combination of Kitade, Daudelin and Kubo with respect to claim 1. Accordingly, it is respectfully submitted that the combination of Kitade, Daudelin, Kubo and Bruckert does not render claims 11 and 12 unpatentable, and hence, the rejection of these claims is improper.

IX. Conclusion

For at least the forgoing reasons, it is respectfully requested that the Examiner's rejection of claims 1-16, 18, 19, 21, 22, 24, 26, 27, 29 and 31 be reversed.

Respectfully submitted,

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APPENDIX

The Appealed Claims

1. An apparatus for configuring a RAKE receiver with N fingers, the apparatus comprising:

a first stage, the first stage configured to use an input signal to find a set of more than N paths;

a second stage, the second stage configured to use the first set of more than N paths, the input signal and a quality signal from the RAKE receiver to generate a set of N paths, the second stage generates the set of N paths more frequently than the first stage generates the set of more than N paths; and

a third stage, the third stage configured to use the set of N paths to configure the N fingers of the RAKE receiver.

2. An apparatus as described in claim 1, the first stage configured to use an input signal to find a set of M paths, the second stage comprising M correlators, the second stage configured to use the outputs of the M correlators to generate the set of N paths.

3. An apparatus as described in claim 1, the first stage configured to use an input signal to find a set of M paths, the second stage comprising 3*M correlators, wherein 3 correlators are assigned to each of the M paths, and the second stage configured to use the 3*M correlators to generate M estimates.

4. An apparatus as described in claim 3, the second stage configured to use the M estimates to generate a second set of paths.

5. An apparatus as described in claim 1, the second stage configured to use the input signal to generate a new set of N paths.

6. An apparatus as described in claim 5, the second stage configured to select the new set of N paths from the first set of more than N paths.

7. An apparatus as described in claim 5, the second stage configured to derive the new set of N paths from the first set of more than N paths.

8. An apparatus as described in claim 1, the first stage configured to use an output of a matched filter to generate the first set of more than N paths.

9. An apparatus as described in claim 8, the second stage configured to generate a new set of N paths while the first stage is inactive.

10. An apparatus as described in claim 8, the second stage configured to generate a new set of N paths while the first stage is active generating a new set of more than N paths.

11. An apparatus as described in claim 1, the apparatus further comprising a quality signal, the first stage configured to generate a new set of more than N paths when the quality signal is less than a threshold value.

12. An apparatus as described in claim 11, the third stage configured to use paths from the second stage until the first stage generates the new set of more than N paths.

13. An apparatus as described in claim 1, the apparatus further comprising a counter, the first stage configured to generate a new set of more than N paths when the value of the counter is greater than a pre-set value.

14. An apparatus for configuring a RAKE receiver, the apparatus comprising:
an input signal;
a searcher, the searcher configured to use the input signal to find a set of candidate paths; and,
a selector, the selector configured to use the input signal, the set of candidate paths and a quality signal from the RAKE receiver to select a subset of candidate paths that are used to configure the RAKE receiver, the selector configured to generate a new subset of paths while the searcher is inactive.

15. An apparatus as described in claim 14, the searcher configured to use the input signal to find a set of M candidate paths, the selector comprising M correlators, the selector configured to use the outputs of the M correlators to generate the subset of candidate paths.

16. An apparatus as described in claim 14, the searcher configured to use an output of a matched filter to generate the set of candidate paths.

18. An apparatus as described in claim 16, the selector configured to generate a new subset of paths while the searcher is active generating a new set of candidate paths.

19. An apparatus for configuring a RAKE receiver, the apparatus comprising:
an input signal;
a searcher, the searcher configured to use the input signal to find a set of candidate paths, the set of candidate paths containing M paths; and
a selector, the selector configured to use the input signal, the set of candidate paths and a quality signal from the RAKE receiver to select a smaller set of candidate paths, the selector comprising k*M correlators, wherein K correlators are assigned to each of the selected paths, and the selector configured to use k*M correlators to generate M estimates.

21. An apparatus as described in claim 19, the selector configured to use the M estimates to generate the smaller set of candidate paths.

22. A method for configuring a RAKE receiver, the method comprising the steps of:
finding a first set of paths;

searching the first set of paths to generate a first set of correlation values;

selecting a second set of paths from the first set of paths based on a second set of correlation values and a quality signal from the RAKE receiver; and

updating the second set of paths without updating the first set of paths.

24. A method as described in claim 22, further comprising the step of updating the second set of paths while updating the first set of paths.

26. A method as described in claim 22, wherein the step of selecting the second set of paths further comprises tracking the first set of paths.

27. A method for configuring a RAKE receiver, the method comprising the steps of:

receiving an input signal;

finding a first set of paths;

searching the first set of paths to generate a set of correlation values;

selecting a second set of paths from the first set of paths based on the correlation values, the input signal and a quality signal from the RAKE receiver; and

updating the second set of paths without updating the first set of paths.

29. A method as described in claim 27, further comprising the step of updating the second set of paths while updating the first set of paths.

31. A method as described in claim 27, wherein the step of selecting the second set of paths further comprises tracking the first set of paths.